LYMAN LAKE

Introduction

Lyman Lake is a small lake in the Blacks Fork drainage on the north slope of the High Uintas. It is a natural impoundment, formed by a dam of terminal moraine--glacial rubble. (The China Lake report has a complete description of the process of glaciation.) It is easily accessible by passenger car, and has a youth camp on it. Little Lyman Lake, 100 meters downstream, is much smaller and has a USFS campground on the south shore.

Lyman Lake has a low dam that has artificially raised the water level. This extra water is drawn off in the summer for agricultural use. Because the watershed is so small, natural filling and downcutting have yet to obliterate this lake. The shoreline is owned by the Wasatch-Cache National Forest. Public access is unrestricted, but camping is not permitted outside the campground.

Characteristics and Morphometry

Lake elevation (meters / feet)	2,839 / 9,311
Surface area (hectares / acres)	11 / 27
Watershed area (hectares / acres)	156 / 386
Volume (m^3 / acre-feet)	
capacity	128,000 / 104
conservation pool	
Annual inflow (m^3 / acre-feet)	
Retention time (years)	
Drawdown (m^3 / acre-feet)	
Depth (meters / feet)	
maximum	7.01 / 23
mean	3.05 / 10
Length (meters / feet)	732 / 2,400
Width (meters / feet)	244 / 800
Shoreline (km / miles)	1.6 / 1.02

Location

County	Summit
Longitude / Latitude	110 36 44 / 40 56 20
USGS Map	Lyman Lake, UT / WY 1967
DeLorme's Utah Atlas and Gazetteer™	Page 55, A-4
Cataloging Unit	Black's Fork (1404017)

Recreation

Lyman Lake is about 17 miles east of U-150 on the

North Slope Road (FS-058) of the Uintas. The route from

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U-150 is well signed.

The lake offers fishing and boating. The water is to cold for most swimmers, but a there is a young womens summer camp located on the northeastern end of the lake.

Little Lyman Lake Campground, on Little Lyman Lake, is administered by the Forest Service, and has 10 campsites, running water, and primitive latrines.

Watershed Description

Lyman Lake is in an area of moraine from the Right Fork Backs Fork glaciers. Melting of debris-lain glaciers created this lake basin. The watershed is very small. The watershed drains to the south, contrary to the regional slope. The area around the lake has high elevation coniferous forests on the rolling hills of the moraine. Slopes average 9%. There are two small tributary streams (2.8% gradient, or 147 feet per mile), several springs, and three small ponds. The watershed high point, a point 1 mile north of the lake, is 2,926 m (9,600 ft) above sea level, thereby developing a complex slope of 6.5% to the reservoir. The outflow is a small stream that joins Blacks Fork 1/2 mile below Little Lyman Lake.

The soil in the watershed is entirely glacial till and alluvium. It is comprised not only of debris from the scouring of Precambrian rock of upstream valleys, but also a variety of strata in the transition zone to the Tertiary strata in the Lyman Lake area. Therefore the till is chemically erratic. See Appendix III for a complete soil description.

The vegetation community is comprised of coniferous forest and marshland. The watershed receives 51 - 64 cm (20 - 25 inches) of precipitation annually with a frost-free season of 20 - 40 days.

Land use is multiple use in the all areas except the youth camp.

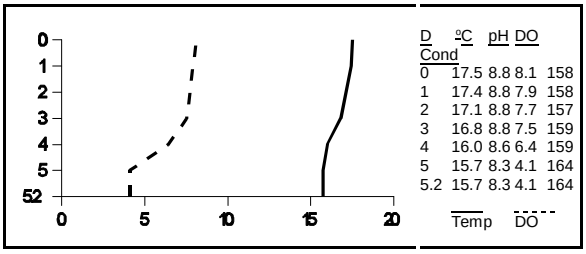
Limnological Assessment

The water quality of Lyman Lake is considered very good. It is considered to be moderately hard with a hardness concentration value of approximately 94 mg/L (CaCO3). There are no parameters that have exceeded State water quality standards for defined beneficial uses. The average concentration of total phosphorus in the

Limnological Data

Data sampled from STORET site: 593986

Surface Data	1992
Trophic Status	O
Chlorophyll TSI	29.57
Secchi Depth TSI	36.66
Phosphorous TSI	46.98
Average TSI	37.74
Chlorophyll a (ug/L)	0.9
Transparency (m)	5.1
Total Phosphorous (ug/L)	20
pH	8.8
Total Susp. Solids (mg/L)	<3
Total Volatile Solids (mg/L)	1
Total Residual Solids (mg/L)	2
Temperature (°C / °f)	15/59
Conductivity (umhos.cm)	173
Water Column Data	
Ammonia (mg/L)	0.07
Nitrate/Nitrite (mg/L)	0.01
Hardness (mg/L)	95
Alkalinity (mg/L)	94
Silica (mg/L)	2.0
Total Phosphorous (ug/L)	18
Miscellaneous Data	
Limiting Nutrient	N
DO (Mg/l) at 75% depth	6.5
Stratification (m)	NO
Depth at Deepest Site (m)	5.2



D	°C	pH	DO	Cond
0	17.5	8.8	8.1	158
1	17.4	8.8	7.9	158
2	17.1	8.8	7.7	157
3	16.8	8.8	7.5	159
4	16.0	8.6	6.4	159
5	15.7	8.3	4.1	164
5.2	15.7	8.3	4.1	164

water column in 1992 was 18 ug/L. Although no exceedences of the water quality standards is noted, there are water quality impairments in Lyman Lake. The lake has an extensive growth of macrophytes present, primarily submerged in the water column. The lake by nature is to shallow to permit stratification of the lake. However, it should be noted that dissolved oxygen concentration decline near the bottom of the lake which is indicative of the large amount of macrophytes present. Although the macrophytes produce oxygen during the day through the process of photosynthesis, during the night they consume oxygen in respiration. These large masses of macrophytes produce anoxic conditions during extended ice coverage during the winter. As winter sets in the macrophytes die off and settle in the bottom of the lake and begin to decompose. This decomposition process utilizes the dissolved oxygen present in the water column. As the dissolved oxygen is diminished, anoxic conditions develop and the potential for fish kills exists. DWR has reported winter fish kills during recent years due to lack of oxygen. Current data suggest that the reservoir is nitrogen limited system. TSI values indicate the reservoir is oligotrophic, but water quality impairments do exist.

According to DWR stocking reports the reservoir is stocked with 1,000 fingerling brook trout (*Salvelinus fontinalis*), 1-2000 catchable rainbow trout (*Oncorhynchus mykiss*), and 1,000 albino rainbow trout. The lake has not been treated for rough fish competition, so populations of native fishes may still be present in the lake.

Phytoplankton in the euphotic zone include the following taxa (in order of dominance)

Species	Cell Volume (mm^3/liter)	% Density By Volume
Oocystis sp.	0.100	43.90
Dinobryon divergens	0.049	21.46
Pennate diatoms	0.039	17.07
Centric diatoms	0.023	10.24
Scenedesmus bijuga	0.011	4.88
Total	0.222	

Shannon-Weaver [H']	1.46
Species Evenness	0.82
Species Richness	0.26

The flora is fairly typical, but not particularly diverse. The dominance of green algae and diatoms indicates that the lake is reasonably healthy.

Pollution Assessment

Nonpoint pollution sources are sedimentation and nutrient loading from grazing, and wastes or litter from recreation. Cattle graze in the watershed and probably around the reservoir.

There are no point pollution sources in the watershed.

Beneficial Use Classification

The state beneficial use classifications include: recreational bathing (swimming) 2A, boating and similar recreation (excluding swimming) (2B), cold water game fish and organisms in their food chain (3A) and agricultural uses (4).

Information

Management Agencies	
Wasatch-Cache National Forest	524-5030
Evanston Ranger District	307-789-3194
Mountainlands Association of Governments	377-2262
Division of Wildlife Resources	538-4700
Division of Water Quality	538-6146
Recreation	
Mountainland Travel Region (Provo)	377-2262
Reservoir Administrators	
Lyman Reservoir and Irrigation Company	